

### REMARKS

Claims 1, 3-6 and 8-19 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. In particular, claims 1, 3-6 and 8-19 were said to be drawn to a mathematical algorithm per se that do nothing more than solve a mathematical problem or manipulate abstract ideas or concepts. In particular, it was asserted that estimating a set of log magnitude frequency values for a clean speech signal did not have any practical application. Further, claims 12-19 were said to be drawn to a program per se because its computer-readable storage medium is defined in the specification as "any other medium".

### CLAIMS 1, 3-6 AND 8-11

With the present amendment, claim 1 has been amended to add a limitation of using the log-magnitude values for the clean speech signal to produce an output clean speech signal. Support for this amendment is found on page 14, lines 3-27. Since the preamble of claim 1 indicated that it was directed to a method of identifying a clean speech signal from a noisy speech signal, the added limitation simply places the context of the preamble in the body of claim 1. Thus, no new issues are being raised by this amendment since it simply reflects the intention of claim 1 at the time of filing and since it is presumed that the Examiner has examined claim 1 in the context of the claim producing a clean speech signal. As such, Applicants request entry of the amendment to claim 1.

As amended, claim 1 defines statutory subject matter.

### 1. THE LAW OF PATENTABLE SUBJECT MATTER

§101 extends the offer of patent protection to "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof". As Congress commented in passing the statute, it was intended to cover "anything under the sun that was made by man", and the Supreme Court and the Court of Appeals for the Federal Circuit have both reiterated that observation, along with noting that the repeated usage of the word "any" applied to expansive descriptions of subject matter, were intended to emphasize that no

restrictions were to be placed on patentable subject matter other than those specifically recited in §101. (S. Rep. No. 1979, 82d Congress, 2d Sess., 5 (1952); *Diamond v. Chakrabarty*, 447 U.S. 303, 206 USPQ 193 (1980); *State Street Bank & Trust v. Signature Financial Group*, 47 USPQ2d 1596, 1600 (Fed. Cir. 1998) (Rich, J.).)

Claims directed to methods have been found to be within the "process" category of §101. *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447, 1450 (Fed. Cir. 1999) and MPEP §2106 IV A.

Despite the seemingly limitless expanse to patentable subject matter, the Supreme Court has identified three categories of unpatentable subject matter: "laws of nature, natural phenomena, and abstract ideas." *Diamond v. Diehr*, 450 U.S. 175, 185, 209 USPQ 1 (1981) However, determining what is an "abstract idea" has been difficult for the courts. As noted by the U.S. Court of Appeals for the Federal Circuit "this court (and its predecessor) has struggled to make our understanding of the scope of §101 responsive to the needs of the modern world." *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447, 1452 (Fed. Cir. 1999)

In *AT&T*, the Federal Circuit gave some guidance by stating that "the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a 'useful, concrete and tangible result.'" *AT&T* at 1453. The formation of a 'useful, concrete and tangible result' in a claim constitutes a practical application of a mathematical algorithm, formula, or calculation and is therefore patentable subject matter. *State Street* at 1601.

Similarly, the Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility as found in MPEP 2106 (IV)(C) indicates that abstract ideas are not patentable subject matter under 35 U.S.C. §101 but that "practical applications" of abstract ideas are patentable subject matter. A claimed invention is a practical application of an abstract idea if either:

"The claimed invention 'transforms' an article or physical object to a different state or thing." or

"The claimed invention otherwise produces a useful, concrete and tangible result, based on the factors discussed below." (MPEP 2106(IV)(C)(2))

Note that the case law and the Interim Guidelines do not require a claimed use for the "useful, concrete and tangible result". They only require the production of a "useful, concrete and tangible result."

The question then becomes: What constitutes a "useful, concrete and tangible result?"

The term "useful" appears in §101 and requires nothing more than a specific, substantial and credible utility. (MPEP 2107.01)

The terms "concrete" and "tangible" have not been directly defined. However, a review of recent cases that have attempted to use this standard is instructive.

The phrase "useful, concrete, and tangible result" first appears in *In re Alappat*, 31 USPQ2d 1545 (Fed. Cir. 1994). The claims at issue in *Alappat* were directed to a rasterizer that included as a last limitation "means for outputting illumination intensity data as a predetermined function of the normalized vertical distance." Thus, the "result" in *Alappat* is "illumination intensity data", which was considered concrete and tangible. This data is nothing more than numbers that represent a specific intensity level for light that may appear on a display at some point in the future. Nonetheless, the data was considered patentable subject matter.

In *State Street Bank & Trust v. Signature Financial Group*, 47 USPQ2d 1596, 1600 (Fed. Cir. 1998), the Federal Circuit built on the "useful, concrete and tangible result" test by finding that a data processing system that produces "price, profit, percentage, cost, or loss" provides a useful, concrete and tangible result even though these values are expressed as numbers. *State Street Bank* at 1602. The numbers identified as a useful, concrete and tangible result merely represent the state of an accounting system for a mutual fund. In addition, the claims in *State Street Bank* do not recite a use for these values. Thus, the values produced were considered "useful, concrete and tangible" even without a claimed use for those values.

Lastly, in *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447, (Fed. Cir. 1999), the Federal Circuit applied the "useful, concrete and tangible result" test to a method claim. In *AT&T*, a method is provided for generating a message record that includes a PIC

indicator. This message record represents a call made on a telephone system. The message record was considered a "useful, concrete and tangible result" even though it is only a collection of data representing a telephone call. In addition, as in *State Street Bank*, the claims in *AT&T* did not include a use for the result of the method. In particular, the claim in *AT&T* simply claims producing a message record. Thus, a method claim does not need to include a use for a result of the method but instead simply has to generate a "useful, concrete and tangible result" in order to be considered a practical application of the method.

## 2. APPLICATION OF THE LAW TO THE CLAIMS 1, 3-6, 8-11

Claims 1, 3-6 and 8-11 are directed to a method. As such, all of the claims falls within the "process" category of §101. See 35 U.S.C. 100(b) ("The term 'process' means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.").

Independent claim 1 provides a method of identifying a clean speech signal from a noisy speech signal.

Claims 1 provides a practical application of its method because it produces a "useful, concrete and tangible result." In particular, the output clean speech signal provided by claim 1 is a "useful, concrete and tangible result."

As indicated on page 14, lines 26-28, an output clean speech signal may be written to output audio hardware so that it is perceptible to users or it may be stored. This is similar to the intensity data in *Alappat*, which could be applied to a display to produce an image viewable by users. Since the output clean speech signal can be written to output audio hardware so that it is perceptible to users, it is not a mere abstraction or simply a solution to a mathematical problem. Instead, it is a real-world result that is useful, concrete and tangible. Since the output clean speech signal provided by claim 1 is a useful, concrete and tangible result, claim 1 provides a practical application of its method. As such, claim 1 and claims 3-6 and 8-11, which depend therefrom, represent statutory subject matter under the current case law and the MPEP.

### CLAIMS 12-19

Independent claim 12 has been amended to add a limitation of using the frame of the clean speech signal to produce an output clean speech signal. Support for this amendment is found on page 14, lines 10-28. Applicants respectfully request entry of this amendment, since the rejection of claim 12 based on the assertion that it does not provide a practical application of its steps could have been raised before Applicants' last amendment and as such was not necessitated by Applicants' amendment. In particular, the result of claim 12 before and after Applicants' amendment was the same: an estimate of a frame of a clean speech signal. This means that the rejection asserting that this is not a useful, concrete and tangible result could have been raised before Applicants' amendment and therefore was not necessitated by Applicants' Amendment. As such, Applicants request that either this amendment be entered or the finality of the last Office Action be withdrawn as premature.

As amended, claim 12 provides a practical application of its method because an output clean speech signal is a "useful, concrete, and tangible" result.

As noted above, an output clean speech signal is at least as useful, concrete and tangible as the intensity data found in *Alappat*. As such, claim 12 and claims 13-19, which depend therefrom, provide a practical application of the steps described in claim 12.

Claims 12-19 were also rejected as being drawn to a "program" *per se* because "computer-readable storage medium" was said to be defined in the specification as including "any other medium." Applicants respectfully dispute this assertion.

In the specification on page 6, lines 16-18, it is indicated that a computer storage medium can include "any other medium which can be used to store the desired information and which can be accessed by computer 110." Thus, computer storage medium does not include "any other medium" as suggested in the Office Action, but only those media that can be used to store the desired information and that can be accessed by computer 110. Thus, the claim is not directed to the computer-executable instructions themselves but only to computer-readable storage media that can store the instructions and that can be accessed by a computer. Because the computer-readable storage media must be accessible by a computer, it follows that the computer-readable storage

media are capable of causing functional changes in the computer. The definition of computer storage media in the specification does not allow for an interpretation of computer-readable storage media that would include media outside of a computing environment. As such, claim 12 is not drawn to a computer program *per se*.

In addition, the requirement that the storage media be used to store the desired information would exclude carrier waves since they cannot be used to store the desired information. Such carrier waves are only used to transmit values, they do not have the ability to store values. As such, the specification clearly excludes carrier waves from the definition of computer-readable storage media.

Further claim 12 makes it clear that the computer-readable storage medium stores computer-executable instructions. Since the computer-executable instructions are stored on the computer-readable storage medium instead of being transmitted by the computer-readable storage medium, this further excludes carrier waves from being included in the subject matter of claim 12.

Since the specification clearly indicates that a computer storage media must store desired information and must be capable of being accessed by a computer, claim 12 is not directed to a program *per se* and does not include carrier waves. As such, claim 12, and claims 13-19, which depend therefrom represent statutory subject matter.

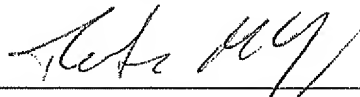
### CONCLUSION

In light of the above remarks, claims 1, 3-6 and 8-19 represent statutory subject matter and are in form for allowance. Reconsideration and allowance of the claims is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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